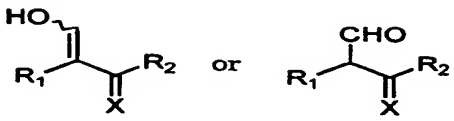
What is claimed is;

1. A process to produce compounds represented by a formula (II);



(II)

wherein

R_1 represents hydrogen, halogeno, alkyl optionally substituted by alkoxy, alkylthio or halogen, alkoxy optionally substituted by halogen or aryl, a group having an alicyclic structure, a group represented by $R_3S(O)q$, a group represented by R_4R_5N, a group represented by $R_6C(=O)$, nitrile, nitro, a group represented by $R_7C(=NR_8)$, aryl or aryloxy optionally substituted by alkoxy, halogen or alkyl which may be substituted by halogen, phenoxy or heteroaryloxy which may be substituted by haloalkyl, alkyl, alkoxy, haloalkoxy, amino, nitrile, alkylthio, alkylsulfonyl or alkylsulfinyl, or aralkyl optionally substituted by halogen,

R_2 represents alkyl optionally substituted by alkoxy, alkylthio or halogen, alkoxy optionally substituted by halogen or aryl, a group having an alicyclic structure, optionally substituted amino, aryl optionally substituted by alkoxy, halogen or alkyl which may be substituted by halogen, phenoxy or heteroaryloxy which may be substituted by haloalkyl, alkyl, alkoxy, haloalkoxy, amino, nitrile, alkylthio, alkylsulfonyl or alkylsulfinyl, optionally substituted heterocyclic or heteroaryl having a 5 to 7 membered mono cyclic or 9 to 11 membered fused ring containing 1 to 3 nitrogen or oxygen, or aralkyl optionally substituted by halogen,

R_3, R_4 and R_5 each independently represents alkyl optionally substituted by alkoxy, alkylthio or halogen, aryl optionally substituted by alkoxy, halogen or alkyl which may be substituted by halogen,

phenoxy or heteroaryloxy which may be substituted by haloalkyl, alkyl, alkoxy, haloalkoxy, amino, nitrile, alkylthio, alkylsulfonyl or alkylsulfinyl, optionally substituted heterocyclic or heteroaryl having a 5 to 7 membered mono cyclic or 9 to 11 membered fused ring containing 1 to 3 nitrogen or oxygen, or aralkyl optionally substituted by halogen,

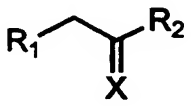
R_6 and R_7 each independently represents alkyl optionally substituted by alkoxy, alkylthio or halogen, alkoxy optionally substituted by halogen or aryl, a group having an alicyclic structure, optionally substituted amino, aryl optionally substituted by alkoxy, halogen or alkyl which may be substituted by halogen, phenoxy or heteroaryloxy which may be substituted by haloalkyl, alkyl, alkoxy, haloalkoxy, amino, nitrile, alkylthio, alkylsulfonyl or alkylsulfinyl, optionally substituted heterocyclic or heteroaryl having a 5 to 7 membered mono cyclic or 9 to 11 membered fused ring containing 1 to 3 nitrogen or oxygen, or aralkyl optionally substituted by halogen,

R_8 represents alkyl optionally substituted by alkoxy, alkylthio or halogen, alkoxy optionally substituted by halogen or aryl, nitrile, nitro, aryl optionally substituted by alkoxy, halogen or alkyl which may be substituted by halogen, phenoxy or heteroaryloxy which may be substituted by haloalkyl, alkyl, alkoxy, haloalkoxy, amino, nitrile, alkylthio, alkylsulfonyl or alkylsulfinyl, optionally substituted heterocyclic or heteroaryl having a 5 to 7 membered mono cyclic or 9 to 11 membered fused ring containing 1 to 3 nitrogen or oxygen, or aralkyl optionally substituted by halogen,

q represents 0, 1 or 2, and R_9 and R_{10} each independently represents hydrogen, lower alkyl or aryl optionally substituted by alkoxy, halogen or alkyl which may be substituted by halogen, phenoxy or heteroaryloxy which may be substituted by haloalkyl, alkyl, alkoxy, haloalkoxy, amino, nitrile, alkylthio, alkylsulfonyl or alkylsulfinyl, and

R_1 and R_2 each represents a group which may bond to jointly form a ring, and

X represents oxygen or a group represented by a formula of NR_9R_{10}, characterized in that the compound is subjected to a reaction with a methylene compound represented by a formula (I);

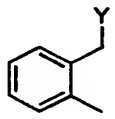


(I)

wherein R_1, R_2 and X are as defined above, with either a formic acid ester or an orthoformic acid ester in the presence of a Lewis acid and a base.

2. The production process according to claim 1, wherein the base is a tertiary amine.

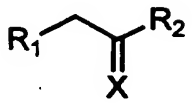
3. The production process according to claim 1, wherein the group represented by R_1 in the formula (I) is a group represented by the following formula;



wherein Y represents a group to be eliminated when it is reacted with a nucleophilic reagent, optionally substituted phenoxy or optionally substituted heteroaryloxy, and the group represented by R_2 is a group represented by a formula of OR_{11}, wherein R_{11} represents lower alkyl.

4. The production process according to claim 1, wherein the compound represented by the formula (I) is methyl 2-[(2-isopropoxy-6-trifluoromethylpyrimidine-4-yl)oxymethyl] phenylacetate.

5. Compound represented a formula (I),



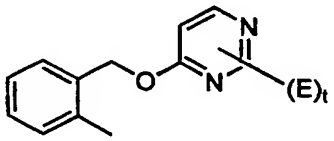
(I)

wherein

R_2 represents alkyl optionally substituted by alkoxy, alkylthio or halogen, alkoxy optionally substituted by halogen or aryl, a group having an alicyclic structure, optionally substituted amino, aryl optionally substituted by alkoxy, halogen or alkyl which may be substituted by halogen, phenoxy or heteroaryloxy which may be substituted by haloalkyl, alkyl, alkoxy, haloalkoxy, amino, nitrile, alkylthio, alkylsulfonyl or alkylsulfinyl, optionally substituted heterocyclic or heteroaryl having a 5 to 7 membered mono cyclic or 9 to 11 membered fused ring containing 1 to 3 nitrogen or oxygen, or aralkyl optionally substituted by halogen,

X represents oxygen or a group represented by a formula of NR_9R_{10} wherein R_9 and R_{10} each independently represents hydrogen, lower alkyl or aryl optionally substituted by alkoxy, halogen or alkyl which may be substituted by halogen, phenoxy or heteroaryloxy which may be substituted by haloalkyl, alkyl, alkoxy, haloalkoxy, amino, nitrile, alkylthio, alkylsulfonyl or alkylsulfinyl, and

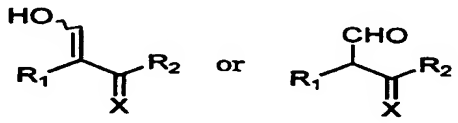
the group represented by R_1 is a group represented by the following formula;



wherein E represents C_{1-6} alkyl, C_{1-6} haloalkyl, C_{1-8} alkoxy, C_{1-6} haloalkoxy, optionally substituted amino, a group represented by a formula of $R_{26}S(O)p$, wherein R_{26} represents alkyl or aryl and p represents 0, 1 or 2, aralkyl optionally substituted by halogen, aryloxy optionally substituted by alkoxy, halogen or alkyl which may be substituted by halogen, phenoxy or heteroaryloxy which may be substituted by haloalkyl, alkyl, alkoxy, haloalkoxy, amino, nitrile, alkylthio, alkylsulfonyl or alkylsulfinyl, optionally substituted heterocyclic or heteroaryl having a 5 to 7 membered mono cyclic

or 9 to 11 membered fused ring containing 1 to 3 nitrogen or oxygen, optionally substituted heteroaryloxy, a group having an alicyclic structure, nitrile, nitro, alkoxycarbonyl, formyl or carboxyl, t represents 0, 1, 2 or 3, provided E each represents a same or different group when t is 2 or more integer.

6. Compounds represented by a formula (II),



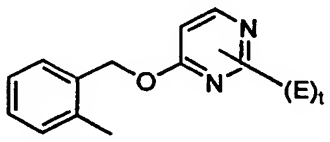
(II)

wherein

R_2 represents alkyl optionally substituted by alkoxy, alkylthio or halogen, alkoxy optionally substituted by halogen or aryl, a group having an alicyclic structure, optionally substituted amino, aryl optionally substituted by alkoxy, halogen or alkyl which may be substituted by halogen, phenoxy or heteroaryloxy which may be substituted by haloalkyl, alkyl, alkoxy, haloalkoxy, amino, nitrile, alkylthio, alkylsulfonyl or alkylsulfinyl, optionally substituted heterocyclic or heteroaryl having a 5 to 7 membered mono cyclic or 9 to 11 membered fused ring containing 1 to 3 nitrogen or oxygen, or aralkyl optionally substituted by halogen,

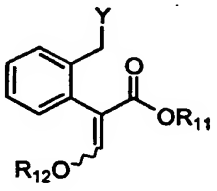
X represents oxygen or a group represented by a formula of NR_9R_{10} wherein R_9 and R_{10} each independently represents hydrogen, lower alkyl or aryl optionally substituted by alkoxy, halogen or alkyl which may be substituted by halogen, phenoxy or heteroaryloxy which may be substituted by haloalkyl, alkyl, alkoxy, haloalkoxy, amino, nitrile, alkylthio, alkylsulfonyl or alkylsulfinyl, and

the group represented by R_1 is a group represented by the following formula;



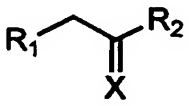
wherein E represents C_{1-6} alkyl, C_{1-6} haloalkyl, C_{1-8} alkoxy, C_{1-6} haloalkoxy, optionally substituted amino, a group represented by a formula of $R_{26}S(O)p$, wherein R_{26} represents alkyl or aryl and p represents 0, 1 or 2, aralkyl optionally substituted by halogen, aryloxy optionally substituted by alkoxy, halogen or alkyl which may be substituted by halogen, phenoxy or heteroaryloxy which may be substituted by haloalkyl, alkyl, alkoxy, haloalkoxy, amino, nitrile, alkylthio, alkylsulfonyl or alkylsulfinyl, optionally substituted heterocyclic or heteroaryl having a 5 to 7 membered mono cyclic or 9 to 11 membered fused ring containing 1 to 3 nitrogen or oxygen, optionally substituted heteroaryloxy, a group having an alicyclic structure, nitrile, nitro, alkoxycarbonyl, formyl or carboxyl, t represents 0, 1, 2 or 3, provided E each represents a same or different group when t is 2 or more integer.

7. A process for producing acrylic acid derivatives represented by a formula (III);



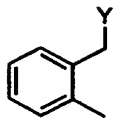
formula (III)

wherein Y represents a group to be eliminated when it is reacted with a nucleophilic reagent, optionally substituted phenoxy or optionally substituted heteroaryloxy, R_{11} represents lower alkyl, and R_{12} represents lower alkyl, cycloalkyl, haloalkyl, allyl, propargyl or aralkyl, characterized in that the compound represented by the formula (I),



(I)

wherein R_1 represents a group represented by the following formula;

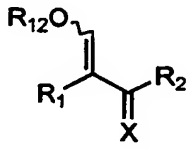


wherein Y is as defined above, R_2 is a group represented by a formula of OR_{11}, wherein R_{11} is as defined above, and X represents oxygen, is formylated by using either a formic acid ester or an orthoformic acid ester in the presence of a Lewis acid and a base and then converted to the alkoxymethylene form.

8. The process for producing acrylic acid derivatives according to claim 7, wherein the base is a tertiary amine.

9. The process for producing acrylic acid derivatives according to claim 7, wherein the compound represented by the general formula (I) is methyl 2-[(2-isopropoxy-6 -trifluoromethylpyrimidine-4-yl)oxymethyl]phenylacetate and the compound represented by the general formula (III) is 3-methoxy-2-[2-{(2-isopropoxy-6 -trifluoromethylpyrimidine-4-yl)oxymethyl}phenyl]acrylic methyl.

10. A process for producing compounds represented by a formula (IV);



(IV)

wherein

R_1 represents hydrogen, halogeno, alkyl optionally substituted by alkoxy, alkylthio or halogen, alkoxy optionally substituted by halogen or aryl, a group having an alicyclic structure, a group

represented by $R_3S(O)q$, a group represented by R_4R_5N, a group represented by $R_6C(=O)$, nitrile, nitro, a group represented by $R_7C(=NR_8)$, aryl or aryloxy optionally substituted by alkoxy, halogen or alkyl which may be substituted by halogen, phenoxy or heteroaryloxy which may be substituted by haloalkyl, alkyl, alkoxy, haloalkoxy, amino, nitrile, alkylthio, alkylsulfonyl or alkylsulfinyl, or aralkyl optionally substituted by halogen,

R_2 represents alkyl optionally substituted by alkoxy, alkylthio or halogen, alkoxy optionally substituted by halogen or aryl, a group having an alicyclic structure, optionally substituted amino, aryl optionally substituted by alkoxy, halogen or alkyl which may be substituted by halogen, phenoxy or heteroaryloxy which may be substituted by haloalkyl, alkyl, alkoxy, haloalkoxy, amino, nitrile, alkylthio, alkylsulfonyl or alkylsulfinyl, optionally substituted heterocyclic or heteroaryl having a 5 to 7 membered mono cyclic or 9 to 11 membered fused ring containing 1 to 3 nitrogen or oxygen, or aralkyl optionally substituted by halogen,

R_3, R_4 and R_5 each independently represents alkyl optionally substituted by alkoxy, alkylthio or halogen, aryl optionally substituted by alkoxy, halogen or alkyl which may be substituted by halogen, phenoxy or heteroaryloxy which may be substituted by haloalkyl, alkyl, alkoxy, haloalkoxy, amino, nitrile, alkylthio, alkylsulfonyl or alkylsulfinyl, optionally substituted heterocyclic or heteroaryl having a 5 to 7 membered mono cyclic or 9 to 11 membered fused ring containing 1 to 3 nitrogen or oxygen, or aralkyl optionally substituted by halogen,

R_6 and R_7 each independently represents alkyl optionally substituted by alkoxy, alkylthio or halogen, alkoxy optionally substituted by halogen or aryl, a group having an alicyclic structure, optionally substituted amino, aryl optionally substituted by alkoxy, halogen or alkyl which may be substituted by halogen, phenoxy or heteroaryloxy which may be substituted by haloalkyl, alkyl, alkoxy, haloalkoxy, amino, nitrile, alkylthio, alkylsulfonyl or alkylsulfinyl, optionally substituted heterocyclic

or heteroaryl having a 5 to 7 membered mono cyclic or 9 to 11 membered fused ring containing 1 to 3 nitrogen or oxygen, or aralkyl optionally substituted by halogen,

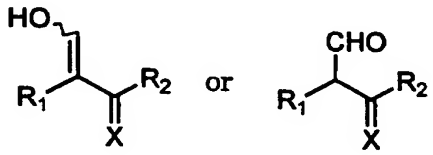
R_8 represents alkyl optionally substituted by alkoxy, alkylthio or halogen, alkoxy optionally substituted by halogen or aryl, nitrile, nitro, aryl optionally substituted by alkoxy, halogen or alkyl which may be substituted by halogen, phenoxy or heteroaryloxy which may be substituted by haloalkyl, alkyl, alkoxy, haloalkoxy, amino, nitrile, alkylthio, alkylsulfonyl or alkylsulfinyl, optionally substituted heterocyclic or heteroaryl having a 5 to 7 membered mono cyclic or 9 to 11 membered fused ring containing 1 to 3 nitrogen or oxygen, or aralkyl optionally substituted by halogen,

q represents 0, 1 or 2,

R_1 and R_2 each represents a group which may bond to jointly form a ring, and

R_{12} represents lower alkyl, cycloalkyl, haloalkyl, allyl, propargyl or aralkyl,

characterized in that the compounds are produced by reacting a formyl form represented by a formula (II);

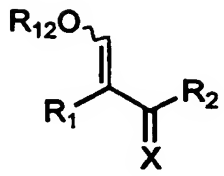


formula (II)

wherein R_1, R_2 are as defined above and X represents oxygen or a group represented by a formula of NR_9R_{10} wherein R_9 and R_{10} each independently represents hydrogen, lower alkyl or aryl optionally substituted by alkoxy, halogen or alkyl which may be substituted by halogen, phenoxy or heteroaryloxy which may be substituted by haloalkyl, alkyl, alkoxy, haloalkoxy, amino, nitrile, alkylthio, alkylsulfonyl or alkylsulfinyl,

with an alcohol represented by a formula of $R_{12}OH$, wherein R_{12} is as defined above, in the presence of an acid catalyst.

11. A process for producing compounds represented by a formula (IV);



(IV)

wherein

R_1 represents hydrogen, halogeno, alkyl optionally substituted by alkoxy, alkylthio or halogen, alkoxy optionally substituted by halogen or aryl, a group having an alicyclic structure, a group represented by $R_3S(O)q$, a group represented by R_4R_5N, a group represented by $R_6C(=O)$, nitrile, nitro, a group represented by $R_7C(=NR_8)$, aryl or aryloxy optionally substituted by alkoxy, halogen or alkyl which may be substituted by halogen, phenoxy or heteroaryloxy which may be substituted by haloalkyl, alkyl, alkoxy, haloalkoxy, amino, nitrile, alkylthio, alkylsulfonyl or alkylsulfinyl, or aralkyl optionally substituted by halogen,

R_2 represents alkyl optionally substituted by alkoxy, alkylthio or halogen, alkoxy optionally substituted by halogen or aryl, a group having an alicyclic structure, optionally substituted amino, aryl optionally substituted by alkoxy, halogen or alkyl which may be substituted by halogen, phenoxy or heteroaryloxy which may be substituted by haloalkyl, alkyl, alkoxy, haloalkoxy, amino, nitrile, alkylthio, alkylsulfonyl or alkylsulfinyl, optionally substituted heterocyclic or heteroaryl having a 5 to 7 membered mono cyclic or 9 to 11 membered fused ring containing 1 to 3 nitrogen or oxygen, or aralkyl optionally substituted by halogen,

R_3, R_4 and R_5 each independently represents alkyl optionally substituted by alkoxy, alkylthio or halogen, aryl optionally substituted by alkoxy, halogen or alkyl which may be substituted by halogen,

phenoxy or heteroaryloxy which may be substituted by haloalkyl, alkyl, alkoxy, haloalkoxy, amino, nitrile, alkylthio, alkylsulfonyl or alkylsulfinyl, optionally substituted heterocyclic or heteroaryl having a 5 to 7 membered mono cyclic or 9 to 11 membered fused ring containing 1 to 3 nitrogen or oxygen, or aralkyl optionally substituted by halogen,

R_6 and R_7 each independently represents alkyl optionally substituted by alkoxy, alkylthio or halogen, alkoxy optionally substituted by halogen or aryl, a group having an alicyclic structure, optionally substituted amino, aryl optionally substituted by alkoxy, halogen or alkyl which may be substituted by halogen, phenoxy or heteroaryloxy which may be substituted by haloalkyl, alkyl, alkoxy, haloalkoxy, amino, nitrile, alkylthio, alkylsulfonyl or alkylsulfinyl, optionally substituted heterocyclic or heteroaryl having a 5 to 7 membered mono cyclic or 9 to 11 membered fused ring containing 1 to 3 nitrogen or oxygen, or aralkyl optionally substituted by halogen,

R_8 represents alkyl optionally substituted by alkoxy, alkylthio or halogen, alkoxy optionally substituted by halogen or aryl, nitrile, nitro, aryl optionally substituted by alkoxy, halogen or alkyl which may be substituted by halogen, phenoxy or heteroaryloxy which may be substituted by haloalkyl, alkyl, alkoxy, haloalkoxy, amino, nitrile, alkylthio, alkylsulfonyl or alkylsulfinyl, optionally substituted heterocyclic or heteroaryl having a 5 to 7 membered mono cyclic or 9 to 11 membered fused ring containing 1 to 3 nitrogen or oxygen, or aralkyl optionally substituted by halogen,

q represents 0, 1 or 2,

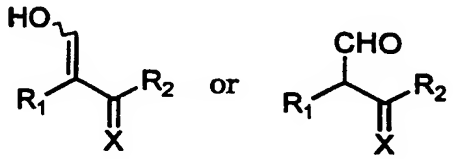
R_1 and R_2 each represents a group which may bond to jointly form a ring, and

R_{12} represents lower alkyl, cycloalkyl, haloalkyl, allyl, propargyl or aralkyl, and

X represents oxygen or a group represented by a formula of NR_9R_{10} wherein R_9 and R_{10} each independently represents hydrogen, lower alkyl or aryl optionally substituted by alkoxy, halogen or alkyl which may be substituted by halogen, phenoxy or heteroaryloxy which may be substituted by

haloalkyl, alkyl, alkoxy, haloalkoxy, amino, nitrile, alkylthio, alkylsulfonyl or alkylsulfinyl,

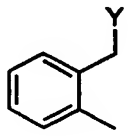
characterized in that a formyl form represented by a formula (II);



(II)

wherein R_1, R_2 and X are as defined above, is reacted with an alcohol represented by a formula of $R_{12}OH$, wherein R_{12} is as defined above, and an orthoformic acid ester represented by a formula of $R_{13}C(OR_{12})_3$, wherein R_{12} is as defined above and R_{13} represents hydrogen, lower alkyl, cycloalkyl, haloalkyl or aralkyl, in the presence of an acid catalyst.

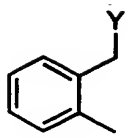
12. The production process according to claim 1, wherein the group represented by R_1 in the compound represented by the formula (II) is a group represented by the following formula;



wherein

Y represents a group to be eliminated when it is reacted with a nucleophilic reagent, optionally substituted phenoxy or optionally substituted heteroaryloxy, and the group represented by R_2 is a group represented by a formula of OR_{11}, wherein R_{11} represents lower alkyl.

13. The production process according to claim 10, wherein the group represented by R_1 in the compound represented by the formula (II) is a group represented by the following formula;



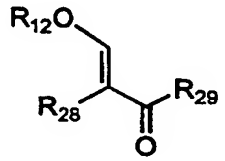
wherein

Y represents a group to be eliminated when it is reacted with a nucleophilic reagent, optionally substituted phenoxy or optionally substituted heteroaryloxy, and the group represented by R_2 is a group represented by a formula of OR_{11}, wherein R_{11} represents lower alkyl.

14. The production process according to claim 10, wherein the compound represented by the formula (II) is 3-hydroxy-2-[2-{(2-isopropoxy-6 -trifluoromethylpyrimidine-4yl)oxymethyl}phenyl]acrylic methyl.

15. The production process according to claim 11, wherein the compound represented by the formula (II) is 3-hydroxy-2-[2-{(2-isopropoxy-6 -trifluoromethylpyrimidine-4yl)oxymethyl}phenyl]acrylic methyl.

16. A process for producing compounds represented by a formula (VI-1);



(VI-1)

wherein

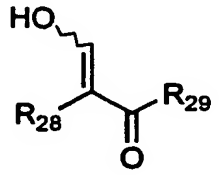
R_{28} represents optionally substituted alkyl, optionally substituted hydrocarbon containing an alicyclic structure, optionally substituted phenyl or optionally substituted heterocyclic group,

R_{29} represents C_{1-6} alkyl, C_{3-8} cycloalkyl, hydroxy, C_{1-6} alkoxy, amino, a group represented by a formula of NHr_1, wherein r_1 represents C_{1-6} alkyl, C_{1-6} alkoxy or optionally substituted phenyl, a group represented by a formula of Nr_2r_3, wherein r_2 and r_3 each independently represents C_{1-6} alkyl, C_{1-6} alkoxy or optionally substituted phenyl, optionally substituted hydrocarbon containing an

alicyclic structure, optionally substituted phenyl or optionally substituted heterocyclic group, and

R_{12} represents lower alkyl, cycloalkyl, haloalkyl, allyl, propargyl or aralkyl,

containing a step to O-alkylate a compound represented by a general formula (V);

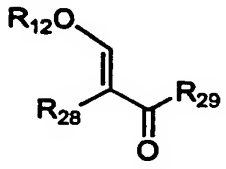


(V)

wherein R_{28} and R_{29} are as defined above,

characterized in that the step to O-alkylate the compound represented by the general formula (V) contains a step to apply an alkylating agent to the compound represented by the general formula (V) in a bilayer mixed-solvent system consisting of an organic solvent and water in the presence of a phase-transfer catalyst and any of an alkali metal hydroxide excluding the lithium salt, an alkali metal carbonate excluding the lithium salt, an alkaline earth metal hydroxide and an alkaline earth metal carbonate while maintaining the concentration of the base in the aqueous solution at 10 wt% or lower.

17. A process for producing compounds represented by a formula (VI-1);



(VI-1)

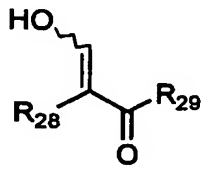
wherein

R_{28} represents optionally substituted alkyl, optionally substituted hydrocarbon containing an alicyclic structure, optionally substituted phenyl or optionally substituted heterocyclic group,

R_{29} represents C_{1-6} alkyl, C_{3-8} cycloalkyl, hydroxy, C_{1-6} alkoxy, amino, a group represented by a formula of NHr_1, wherein r_1 represents C_{1-6} alkyl, C_{1-6} alkoxy or optionally substituted phenyl, a group represented by a formula of Nr_2r_3, wherein r_2 and r_3 each independently represents C_{1-6} alkyl, C_{1-6} alkoxy or optionally substituted phenyl, optionally substituted hydrocarbon containing an alicyclic structure, optionally substituted phenyl or optionally substituted heterocyclic group, and

R_{12} represents lower alkyl, cycloalkyl, haloalkyl, allyl, propargyl or aralkyl,

containing a step to O-alkylate a compound represented by a general formula (V);



(V)

wherein R_{28} and R_{29} are as defined above,

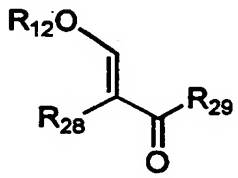
characterized in that the step to O-alkylate the compound represented by the general formula (V) contains a step to simultaneously feed dropwise an aqueous solution of any of an alkali metal hydroxide excluding the lithium salt, an alkali metal carbonate exclusing the lithium salt, an alkaline earth metal hydroxide and an alkaline earth metal carbonate, and an organic solvent solution of the compound represented by the formula (V) into a bilayer mixed-solvent system consisting of an organic solvent containing an alkylating agent and a phase-transfer catalyst.

18. The process for producing compounds represented by the formula (VI-1) according to claim 17, wherein the step to O-alkylate the compound represented by the formula (V) is to O-alkylate a compound represented by the formula (V) while maintaining the concentration of the base in the aqueous layer at 10 wt% or lower.

19. The process for producing compounds represented by the formula (VI-1) according to claim 16, characterized in that the step to O-alkylate a compound represented by the formula (V) is to O-alkylate a compound represented by the formula (V) while maintaining the concentration of the base in the aqueous layer at 6 wt% or lower.

20. The process for producing compounds represented by the formula (VI-1) according to claim 17, characterized in that the step to O-alkylate a compound represented by the formula (V) is to O-alkylate a compound represented by the formula (V) while maintaining the concentration of the base in the aqueous layer at 6 wt% or lower.

21. A process for producing compounds represented by a formula (VI-1);



(VI-1)

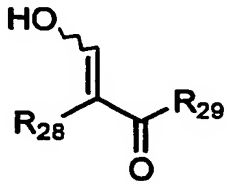
wherein

R_{28} represents optionally substituted alkyl, optionally substituted hydrocarbon containing an alicyclic structure, optionally substituted phenyl or optionally substituted heterocyclic group,

R_{29} represents C_{1-6} alkyl, C_{3-8} cycloalkyl, hydroxy, C_{1-6} alkoxy, amino, a group represented by a formula of NHr_1, wherein r_1 represents C_{1-6} alkyl, C_{1-6} alkoxy or optionally substituted phenyl, a group represented by a formula of Nr_2r_3, wherein r_2 and r_3 each independently represents C_{1-6} alkyl, C_{1-6} alkoxy or optionally substituted phenyl, optionally substituted hydrocarbon containing an alicyclic structure, optionally substituted phenyl or optionally substituted heterocyclic group, and

R_{12} represents lower alkyl, cycloalkyl, haloalkyl, allyl, propargyl or aralkyl,

containing a step to O-alkylate a compound represented by a formula (V);



(V)

wherein R_{28} and R_{29} are as defined above, characterized in that the step to O-alkylate a compound

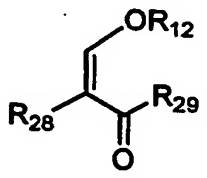
represented by the formula (V) contains a step to feed dropwise a solution of either the alkali metal salt or the alkaline earth meatl salt excluding the lithium salt of the compound represented by the formula (V) into a bilayer mixed-solvent system consisting of an organic solvent solution, which contains an alkylating agent and a phase-transfer catalyst, and water.

22. The process for producing compounds represented by the formula (VI-1) according to claim 21, characterized in that the step to O-alkylate a compound represented by the formula (V) is a step to O-alkylate a compound represented by the formula (V) while maintaining the concentration of the alkali metal salt or the alkaline earth metal salt excluding the lithium salt of the compound represented by the general formula (V) at 10 wt% or lower.

23. The process for producing compounds represented by the formula (VI-1) according to claim 16, characterized in that either sodium hydroxide or potassium hydroxide is used as the alkali metal hydroxide.

24. The process for producing compounds represented by the formula (VI-1) according to claim 17, characterized in that either sodium hydroxide or potassium hydroxide is used as the alkali metal hydroxide.

25. A process for producing compounds represented by a formula (VI-2);



(VI-2)

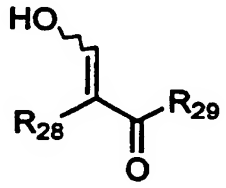
wherein

R_{28} represents optionally substituted alkyl, optionally substituted hydrocarbon containing an alicyclic structure, optionally substituted phenyl or optionally substituted heterocyclic group,

R_{29} represents C_{1-6} alkyl, C_{3-8} cycloalkyl, hydroxy, C_{1-6} alkoxy, amino, a group represented by

a formula of NHr_1, wherein r_1 represents C_{1-6} alkyl, C_{1-6} alkoxy or optionally substituted phenyl, a group represented by a formula of Nr_2r_3, wherein r_2 and r_3 each independently represents C_{1-6} alkyl, C_{1-6} alkoxy or optionally substituted phenyl, optionally substituted hydrocarbon containing an alicyclic structure, optionally substituted phenyl or optionally substituted heterocyclic group, and R_{12} represents lower alkyl, cycloalkyl, haloalkyl, allyl, propargyl or aralkyl,

containing a step to O-alkylate a compound represented by a formula (V);



(V)

wherein R_{28} and R_{29} are as defined above, characterized in that the step to O-alkylate a compound represented by the general formula (V) contains a step to apply an alkylating agent to the compound represented by the formula (V) in a bilayer mixed-solvent system consisting of an organic solvent and water in the presence of a phase-transfer catalyst and either lithium hydroxide or lithium carbonate.

26. The process for producing compounds represented by the formula (VI-2) according to claim 25, characterized in that the step to O-alkylate a compound represented by the formula (V) is a step to O-alkylate the compound represented by the formula (V) while maintaining the concentration of either the lithium hydroxide or the lithium carbonate in the aqueous layer at 5 wt% or higher.

27. The process for producing compounds represented by the formula (VI-1) according to claim 16, wherein a quartenary ammonium salt is used as the phase-transfer catalyst.

28. The process for producing compounds represented by the formula (VI-1) according to claim 17, wherein a quartenary ammonium salt is used as the phase-transfer catalyst.

29. The process for producing compounds represented by the formula (VI-1) according to

claim 19, wherein a quartenary ammonium salt is used as the phase-transfer catalyst.

30. The process for producing compounds represented by the formula (VI-1) according to claim 20, wherein a quartenary ammonium salt is used as the phase-transfer catalyst.

31. The process for producing compounds represented by the formula (VI-2) according to claim 25, wherein a quartenary ammonium salt is used as the phase-transfer catalyst.

32. The process for producing compounds represented by the formula (VI-1) according to claim 16, wherein a quartenary ammonium hydroxide is used as the phase-transfer catalyst.

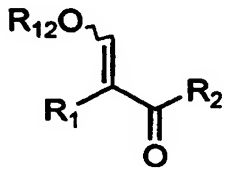
33. The process for producing compounds represented by the formula (VI-1) according to claim 17, wherein a quartenary ammonium hydroxide is used as the phase-transfer catalyst.

34. The process for producing compounds represented by the formula (VI-1) according to claim 19, wherein a quartenary ammonium hydroxide is used as the phase-transfer catalyst.

35. The process for producing compounds represented by the formula (VI-1) according to claim 20, wherein a quartenary ammonium hydroxide is used as the phase-transfer catalyst.

36. The process for producing compounds represented by the formula (VI-2) according to claim 25, wherein a quartenary ammonium hydroxide is used as the phase-transfer catalyst.

37. A process for producing compounds represented by a formula (XII);



(XII)

wherein

R_1 represents hydrogen, halogeno, alkyl optionally substituted by alkoxy, alkylthio or halogen, alkoxy optionally substituted by halogen or aryl, a group having an alicyclic structure, a group represented by $R_3S(O)q$, a group represented by R_4R_5N, a group represented by $R_6C(=O)$, nitrile, nitro, a group represented by $R_7C(=NR_8)$, aryl or aryloxy optionally substituted by alkoxy, halogen or alkyl which may be substituted by halogen, phenoxy or heteroaryloxy which may be substituted by haloalkyl, alkyl, alkoxy, haloalkoxy, amino, nitrile, alkylthio, alkylsulfonyl or alkylsulfinyl, or aralkyl optionally substituted by halogen,

R_2 represents alkyl optionally substituted by alkoxy, alkylthio or halogen, alkoxy optionally substituted by halogen or aryl, a group having an alicyclic structure, optionally substituted amino, aryl optionally substituted by alkoxy, halogen or alkyl which may be substituted by halogen, phenoxy or heteroaryloxy which may be substituted by haloalkyl, alkyl, alkoxy, haloalkoxy, amino, nitrile, alkylthio, alkylsulfonyl or alkylsulfinyl, optionally substituted heterocyclic or heteroaryl having a 5 to 7 membered mono cyclic or 9 to 11 membered fused ring containing 1 to 3 nitrogen or oxygen, or aralkyl optionally substituted by halogen,

R_3, R_4 and R_5 each independently represents alkyl optionally substituted by alkoxy, alkylthio or halogen, aryl optionally substituted by alkoxy, halogen or alkyl which may be substituted by halogen, phenoxy or heteroaryloxy which may be substituted by haloalkyl, alkyl, alkoxy, haloalkoxy, amino, nitrile, alkylthio, alkylsulfonyl or alkylsulfinyl, optionally substituted heterocyclic or heteroaryl having a 5 to 7 membered mono cyclic or 9 to 11 membered fused ring containing 1 to 3 nitrogen or oxygen, or aralkyl optionally substituted by halogen,

R_6 and R_7 each independently represents alkyl optionally substituted by alkoxy, alkylthio or halogen, alkoxy optionally substituted by halogen or aryl, a group having an alicyclic structure, optionally

substituted amino, aryl optionally substituted by alkoxy, halogen or alkyl which may be substituted by halogen, phenoxy or heteroaryloxy which may be substituted by haloalkyl, alkyl, alkoxy, haloalkoxy, amino, nitrile, alkylthio, alkylsulfonyl or alkylsulfinyl, optionally substituted heterocyclic or heteroaryl having a 5 to 7 membered mono cyclic or 9 to 11 membered fused ring containing 1 to 3 nitrogen or oxygen, or aralkyl optionally substituted by halogen,

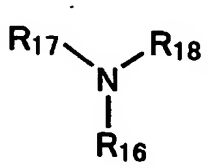
R_8 represents alkyl optionally substituted by alkoxy, alkylthio or halogen, alkoxy optionally substituted by halogen or aryl, nitrile, nitro, aryl optionally substituted by alkoxy, halogen or alkyl which may be substituted by halogen, phenoxy or heteroaryloxy which may be substituted by haloalkyl, alkyl, alkoxy, haloalkoxy, amino, nitrile, alkylthio, alkylsulfonyl or alkylsulfinyl, optionally substituted heterocyclic or heteroaryl having a 5 to 7 membered mono cyclic or 9 to 11 membered fused ring containing 1 to 3 nitrogen or oxygen, or aralkyl optionally substituted by halogen,

q represents 0, 1 or 2,

R_1 and R_2 each represents a group which may bond to jointly form a ring, and

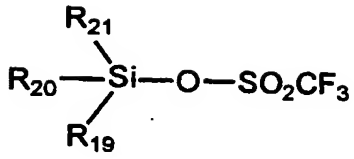
R_{12} represents lower alkyl, cycloalkyl, haloalkyl, allyl, propargyl or aralkyl,

characterized in that the compound represented by a formula (XII) is produced by reacting a tertiary amine compound represented by a formula (VIII);



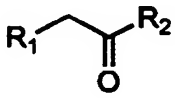
(VIII)

wherein R_{16}, R_{17} and R_{18} may be same or different and represents alkyl, aryl or aralkyl, and an organic silica compound represented by a formula (IX);



(IX)

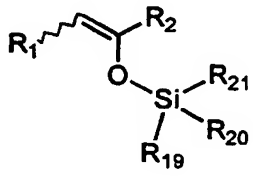
wherein R_{19}, R_{20} and R_{21} may be same or different and represents alkyl, aryl or aralkyl with a compound represented by a formula (VII);



(VII)

wherein R_1 and R_2 are as defined above, and

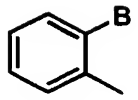
then reacting an orthoformic acid ester compound represented by a formula of $(XI)CH(OCR_{12})_3$, wherein R_{12} is as defined above, with a silylenol ether represented by a formula (X);



(X)

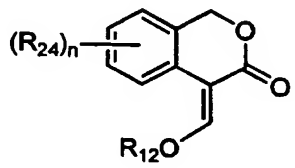
wherein R_1, R_2, R_{19}, R_{20} and R_{21} are as defined above, in the presence of a Lewis acid.

38. The production process according to claim 37, wherein the group represented by R_1 in the compound represented by the formula (VII) is a group represented by the following formula;



wherein B represents hydrogen, lower alkyl, lower alkoxy, haloalkyl, optionally substituted arylsulfonyloxyalkyl or optionally substituted lower alkylsulfonyloxyalkyl, and the group represented by R_2 is a group represented by a formula of OR_{23}, wherein R_{23} represents lower alkyl, and B and R_{23} are a group which may bond to jointly form a ring.

39. A process for producing α-alkoxymethylenecarbonyl compounds represented by a formula (XV);



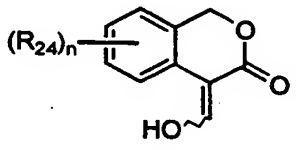
(XV)

wherein

R_{24} represents nitro, cycno, halogeno, C_{1-6} alkyl, C_{1-6} alkoxy, C_{1-6} haloalkyl, or C_{1-6} alkoxycarbonyl,

R_{12} represents lower alkyl, cycloalkyl, haloalkyl, allyl, propargyl or aralkyl, and

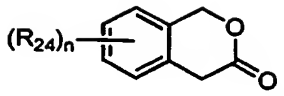
n represents 0 or an integer of 1 to 4, and each of R_{24} may be same or different when n is 2 or more integer, containing a step obtain an α-hydroxymethylenecarbonyl compound represented by a formula (XIV);



(XIV)

wherein R_{24} and n are as defined above, by formylating an isochromanone compound represented by

a formula (XIII);

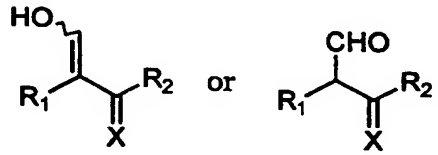


(XIII)

wherein R_{24} and n are as defined above, and a step to O-alkylate a compound represented by the formula (XIV) in a bilayer mixed-solvent system consisting of an organic solvent and water in the presence of a phase-transfer catalyst and a base, without isolating the compound represented by the formula (XIV).

40. The process for producing compounds represented by the formula (XV) according to claim 39, characterized in that the step to formylate the isochromanone compound represented by the formula (XIII) is a step to formylate the compound represented by the formula (XIII) by using an formic acid ester.

41. An after-treatment process in a step to produce compounds represented by a formula (II);



(II)

wherein

R_1 represents hydrogen, halogeno, alkyl optionally substituted by alkoxy, alkylthio or halogen, alkoxy optionally substituted by halogen or aryl, a group having an alicyclic structure, a group represented by $R_3S(O)q$, a group represented by R_4R_5N, a group represented by $R_6C(=O)$, nitrile, nitro, a group represented by $R_7C(=NR_8)$, aryl or aryloxy optionally substituted by alkoxy, halogen or

alkyl which may be substituted by halogen, phenoxy or heteroaryloxy which may be substituted by haloalkyl, alkyl, alkoxy, haloalkoxy, amino, nitrile, alkylthio, alkylsulfonyl or alkylsulfinyl, or aralkyl optionally substituted by halogen,

R_2 represents alkyl optionally substituted by alkoxy, alkylthio or halogen, alkoxy optionally substituted by halogen or aryl, a group having an alicyclic structure, optionally substituted amino, aryl optionally substituted by alkoxy, halogen or alkyl which may be substituted by halogen, phenoxy or heteroaryloxy which may be substituted by haloalkyl, alkyl, alkoxy, haloalkoxy, amino, nitrile, alkylthio, alkylsulfonyl or alkylsulfinyl, optionally substituted heterocyclic or heteroaryl having a 5 to 7 membered mono cyclic or 9 to 11 membered fused ring containing 1 to 3 nitrogen or oxygen, or aralkyl optionally substituted by halogen,

R_3, R_4 and R_5 each independently represents alkyl optionally substituted by alkoxy, alkylthio or halogen, aryl optionally substituted by alkoxy, halogen or alkyl which may be substituted by halogen, phenoxy or heteroaryloxy which may be substituted by haloalkyl, alkyl, alkoxy, haloalkoxy, amino, nitrile, alkylthio, alkylsulfonyl or alkylsulfinyl, optionally substituted heterocyclic or heteroaryl having a 5 to 7 membered mono cyclic or 9 to 11 membered fused ring containing 1 to 3 nitrogen or oxygen, or aralkyl optionally substituted by halogen,

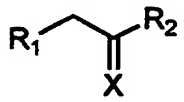
R_6 and R_7 each independently represents alkyl optionally substituted by alkoxy, alkylthio or halogen, alkoxy optionally substituted by halogen or aryl, a group having an alicyclic structure, optionally substituted amino, aryl optionally substituted by alkoxy, halogen or alkyl which may be substituted by halogen, phenoxy or heteroaryloxy which may be substituted by haloalkyl, alkyl, alkoxy, haloalkoxy, amino, nitrile, alkylthio, alkylsulfonyl or alkylsulfinyl, optionally substituted heterocyclic or heteroaryl having a 5 to 7 membered mono cyclic or 9 to 11 membered fused ring containing 1 to 3 nitrogen or oxygen, or aralkyl optionally substituted by halogen,

R_8 represents alkyl optionally substituted by alkoxy, alkylthio or halogen, alkoxy optionally substituted by halogen or aryl, nitrile, nitro, aryl optionally substituted by alkoxy, halogen or alkyl which may be substituted by halogen, phenoxy or heteroaryloxy which may be substituted by haloalkyl, alkyl, alkoxy, haloalkoxy, amino, nitrile, alkylthio, alkylsulfonyl or alkylsulfinyl, optionally substituted heterocyclic or heteroaryl having a 5 to 7 membered mono cyclic or 9 to 11 membered fused ring containing 1 to 3 nitrogen or oxygen, or aralkyl optionally substituted by halogen,

q represents 0, 1 or 2,

R_1 and R_2 each represents a group which may bond to jointly form a ring, and

X represents oxygen or a group represented by a formula of NR_9R_{10} wherein R_9 and R_{10} each independently represents hydrogen, lower alkyl or aryl optionally substituted by alkoxy, halogen or alkyl which may be substituted by halogen, phenoxy or heteroaryloxy which may be substituted by haloalkyl, alkyl, alkoxy, haloalkoxy, amino, nitrile, alkylthio, alkylsulfonyl or alkylsulfinyl,
by reacting a methylene compound represented by a general formula (I);



(I)

wherein R_1, R_2 and X are as defined above, with either an formic acid ester or an orthoformic acid ester in the presence of a Lewis acid and a base, characterized in that the after-treatment process contains a step to add water following to an addition of C_{1-4} organic acid into the reacted solution to improve the separating property of the solution.

42. The after-treatment process according to claim 41, characterized by using the C_{1-4} organic acid in an amount of 2.5 times mole or more of the the Lewis acid to be used.

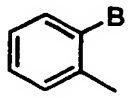
43. The after-treatment process according to claim 41, wherein the C_{1-4} organic acid is

acetic acid.

44. The after-treatment process according to claim 41, wherein the Lewis acid is titanium tetrachloride.

45. The after-treatment process according to claim 41, wherein the base is triethylamine.

46. The after-treatment process according to claim 41, wherein the group represented by R_1 in the compound represented by the formula (I) is a group represented by the following formula;



wherein B represents hydrogen, lower alkyl, lower alkoxy, haloalkyl, optionally substituted arylsulfonyloxyalkyl or optionally substituted lower alkylsulfonyloxyalkyl, and the group represented by R_2 is a group represented by a formula of OR_{23}, wherein R_{23} represents lower alkyl, and B and R_{23} are a group which may bond to jointly form a ring.